



STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

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**Maritimes & Northeast Pipeline, LLC
Hancock County
Township T35 MD, Maine
A-955-71-B-A**

**Departmental
Findings of Fact and Order
Air Emission License
Amendment #2**

After review of the air emissions license amendment application, staff investigation reports and other documents in the applicant's file in the Bureau of Air Quality, pursuant to 38 M.R.S.A., §344 and §590, the Department finds the following facts:

I. REGISTRATION

A. Introduction

1. Maritimes & Northeast Pipeline, LLC (M&N) was issued Air Emission License A-955-71-A-N on February 5, 2007 permitting the operation of emission sources associated with their gas compressor station. The license was subsequently amended on August 17, 2009 (A-955-71-C-M).
2. The equipment addressed in this license is located off Stud Mill Road in Township T35 MD.
3. M&N has requested an amendment to their license to provide revised and updated emissions information for this facility. M&N has refined earlier estimates for potential emissions associated with both combustion and non-combustion sources, as well as natural gas releases that may occur. The following changes are addressed in this amendment:
 - a. Updating VOC emissions estimates to reflect the actual VOC content of the gas;
 - b. Recalculation of potential gas release and fugitive VOC emissions based on updated construction drawings;
 - c. Small revision in the maximum capacity of the turbine and boiler;
 - d. Recalculation of compressor turbine emissions to reflect new startup/shutdown (SU/SD) emissions data from the vendor and adjustment of the number of SU/SD events anticipated per year;
 - e. Recalculation of emissions from the generators based on the actual size of the generators installed, the actual compression ratio for the generator, adjustment of generator short term emission rates to reflect a 110 percent capacity factor, and adjustment of total hours of operation of the generators;
 - f. Removal of Heater #1 from the license;
 - g. Inclusion of fugitive emissions in the licensed facility emissions: and

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- h. Extension of the deadline to perform the initial compliance test on Turbine #1.

B. Emission Equipment

This amendment includes revisions to the following equipment:

Fuel Burning Equipment

<u>Equipment</u>	<u>Maximum Capacity (MMBtu/hr)</u>	<u>Maximum Firing Rate (scf/hr)</u>	<u>Fuel Type</u>	<u>Combustion or Post Combustion Control Equipment</u>	<u>Stack #</u>
Turbine #1	174.9	171,492	Natural Gas	SoLoNOx II	1
Generator #1	5.02	4,920	Natural Gas	none	2
Generator #2	5.02	4,920	Natural Gas	none	3
Generator #3	5.02	4,920	Natural Gas	none	4
Boiler #1	3.9	3,850	Natural Gas	none	5

These generators were originally licensed with a maximum capacity of 14.04 MMBtu/hr and a maximum firing rate of 13,767 scf/hr each.

C. Application Classification

The modification of a minor source is considered a major modification based on whether or not expected emission increases exceed the "Significant Emission Levels" as defined in the Department's regulations. The emission increases are determined by subtracting the current licensed emissions preceding the modification from the maximum future licensed allowed emissions, as follows:

<u>Pollutant</u>	<u>Current License (TPY)</u>	<u>Future License (TPY)</u>	<u>Net Change (TPY)</u>	<u>Sig. Level</u>
PM	5.6	5.1	-0.5	100
PM ₁₀	5.6	5.1	-0.5	100
SO ₂	2.5	2.5	-0-	100
NO _x	55.0	53.8	-1.2	100
CO	92.7	67.2	-25.5	100
VOC	24.5	33.5	+9.0	50

This modification is determined to be a minor modification and has been processed as such.

II. BEST PRACTICAL TREATMENT (BPT)

A. Introduction

In order to receive a license the applicant must control emissions from each unit to a level considered by the Department to represent Best Practical Treatment (BPT), as defined in *Definitions Regulation*, 06-096 CMR 100 (last amended December 24, 2005). Separate control requirement categories exist for new and existing equipment as well as for those sources located in designated non-attainment areas.

BPT for new sources and modifications requires a demonstration that emissions are receiving Best Available Control Technology (BACT), as defined in *Definitions Regulation*, 06-096 CMR 100 (last amended December 24, 2005). BACT is a top-down approach to selecting air emission controls considering economic, environmental and energy impacts.

BPT for existing emissions equipment means that method which controls or reduces emissions to the lowest possible level considering:

- the existing state of technology;
- the effectiveness of available alternatives for reducing emissions from the source being considered; and
- the economic feasibility for the type of establishment involved.

B. Current Gas Analysis

In their original license application, M&N used the VOC content from a typical natural gas analysis to calculate emissions. M&N proposes to update those calculations to reflect the VOC content from the most recent analysis of the gas stream actually flowing through its pipeline. Potential VOC emissions based on the recent gas analysis increased from those in the original application.

C. Updated Construction Drawings

Fugitive emissions of VOC occur from leakage of valves, pump and compressor seals, connectors, flanges, etc. Quantification of VOC emissions from periodic blowdown and fugitive sources was originally based on an estimate of the number and size of the components in a similar existing compressor station. These estimates have been revised to reflect the actual counts and capacities of station components that are shown on the final construction drawings.

D. Compressor Turbine Emissions

M&N has requested revisions to the PTE based on revised estimates for emissions during SU/SD from the manufacturer, and updated information concerning the number and duration of SU/SD.

This amendment incorporates revised emission rates that were issued by Solar Turbines, the compressor turbine/compressor unit vendor. In addition, M&N operations personnel have re-evaluated the likely number of SU/SD events that occur annually and have determined that 65 SU/SD events per year per compressor unit is a more representative number (as opposed to the previously licensed 104 events per year).

E. Generators

The existing license includes three natural gas-fired emergency generators each with a rated heat input capacity of 13.37 MMBtu/hr (14.04 MMBtu/hr at 110% of rated capacity). Emission estimates were based on specifications for a Caterpillar G3606TA LE-130 reciprocating engine. M&N was restricted to the operation of only one engine at any time.

M&N has requested a modification to their license to reflect the units actually installed, three Waukesha VGF24GL 4-stroke, natural gas-fired, lean-burn, low emitting reciprocating engines. These engines (Generators #1, 2, & 3) each have a nominal rating of 395 kW, a rated heat input capacity of 4.55 MMBtu/hr, and a fuel firing rate of 4,457 scf/hr.

These engines are used to provide operating power to the station. At the time of the original application, it was expected that there would not be any occasions when more than one generator would be operating at the same time, resulting in a maximum generator operating time of 8,760 hours/year. It was anticipated that the three generators would operate one at a time to power the station and be cycled according to the manufacturer's recommendations for maximizing the service life of each generator.

However, due to the size of the generators actually installed, two generators may be needed during the brief time (less than one hour) it takes to start the compressor turbine. In addition, no allowance was made for starting a second generator prior to shutting down the "operating" generator. Therefore, M&N has requested a modification to allow more than one generator to operate simultaneously and to limit the annual operating hours of the generators to 9,636 hours/year combined.

A summary of the BACT analysis for Generators #1, 2, & 3 is the following:

1. Generators #1, 2, & 3 shall fire only natural gas.
2. Generators #1, 2, & 3 shall be limited to 9,636 hr/yr of operation combined based on a 12 month rolling total. Compliance shall be demonstrated by a log of all generator operating hours.

3. All emissions are based on use of 110% capacity factor for calculating potential short-term emissions.
4. *Fuel Burning Equipment Particulate Emission Standard*, 06-096 CMR 103 (last amended November 3, 1990) regulates particulate matter emissions from combustion sources. Therefore, a PM limit of 0.12 lb/MMBtu shall be used. The PM₁₀ limits are derived from the PM limits.
5. SO₂ emission limits are based on AP-42 data dated 7/00.
6. NO_x, CO, and VOC emission limits are based upon vendor supplied data.
7. Visible emissions from Generators #1, 2, & 3 shall not exceed 10% opacity on a 6-minute block average except for no more than one (1) six (6) minute block average in a 3-hour period.

F. Boiler #1 and Heater #1

The existing license includes a natural gas-fired boiler with a maximum heat input capacity of 3.2 MMBtu/hr. The actual unit installed has a maximum heat input capacity of 3.9 MMBtu/hr.

Heater #1 was originally licensed with a maximum capacity of 2.7 MMBtu/hr. The actual unit installed has a maximum capacity of less than 1.0 MMBtu/hr and is therefore considered an insignificant activity. Therefore, Heater #1 has been removed from this license.

G. Testing Deadline

Turbine #1 is subject to New Source Performance Standards (NSPS) 40 CFR Part 60, Subpart KKKK, Standards of Performance for Stationary Gas Turbines for which construction commenced after February 18, 2005. Turbines subject to Subpart KKKK are exempt from NSPS Subpart GG, Standards of Performance for Stationary Gas Turbines for which construction commenced after October 3, 1977.

M&N's "Phase IV Project" was constructed to transport gas supplies from a new Canaport liquefied natural gas (LNG) receiving terminal near Saint John, New Brunswick, Canada. As a result, M&N expanded its interstate natural gas pipeline system in the U.S. by installing new facilities in Maine and Massachusetts.

Condition (23)(A) of air emission license A-955-71-A-N requires M&N to perform an initial performance test within 60 days after achieving the maximum production rate at which the facility will be operated but not later than 180 days after the initial startup. Initial startup of the turbine is considered to have occurred on January 15, 2009, the date the Federal Energy Regulatory Commission authorized Maritimes' Phase IV Facilities to be placed into service.

On June 10, 2009 M&N requested an extension of the test deadline because the Canaport LNG terminal was not yet in service and M&N did not have the gas throughput necessary to run the compressor station at sufficient capacity to complete the initial performance testing at the load required. This request was granted and the new deadline was set as October 31, 2009.

Canaport LNG is now operating but at a reduced capacity from its design capacity and the capacity the M&N system is designed to transport. As a result, M&N still cannot insure that it will have the gas throughput necessary to run Turbine #1 at sufficient capacity to complete the initial performance testing as required in 40 CFR § 60.8 and their air emission license.

M&N has requested an extension from EPA to conduct the performance testing associated with its Woodchopping Ridge Compressor Station for an additional 60 days (until December 31, 2009). Since the initial compliance testing schedule is also listed in the air emission license, M&N has also requested a minor revision to the license to address those conditions.

H. Annual Emissions

M&N shall be restricted to the following annual emissions, based on a 12 month rolling total:

Total Licensed Annual Emissions for the Facility
Tons/year
(used to calculate the annual license fee)

	PM	PM₁₀	SO₂	NO_x	CO	VOC
Turbine #1	4.8	4.8	2.5	41.4	56.7	5.3
Generators	0.2	0.2	--	11.3	9.9	4.2
Boiler #1	0.1	0.1	--	1.1	0.6	0.1
Gas Releases & Fugitives	--	--	--	--	--	23.9
Total TPY	5.1	5.1	2.5	53.8	67.2	33.5

ORDER

Based on the above Findings and subject to conditions listed below, the Department concludes that the emissions from this source:

- will receive Best Practical Treatment,
- will not violate applicable emission standards,
- will not violate applicable ambient air quality standards in conjunction with emissions from other sources.

The Department hereby grants Air Emission License A-955-71-B-A subject to the conditions found in Air Emission License A-955-71-A-N, in amendment A-955-71-C-M, and in the following conditions.

Severability. The invalidity or unenforceability of any provision, or part thereof, of this License shall not affect the remainder of the provision or any other provisions. This License shall be construed and enforced in all respects as if such invalid or unenforceable provision or part thereof had been omitted.

The following shall replace Conditions (16)(A) and (16)(B) of air emission license A-955-71-A-N:

(16) Turbine #1

- A. Except during periods of start-up and shut-down, Turbines #1 shall not exceed the following emissions at ambient temperatures greater than 0°F:

Pollutant	ppmvd @ 15% O ₂	lb/hr	lb/MMBtu	Citation
PM	--	1.15	0.01	06-096 CMR 115, BACT
PM ₁₀	--	1.15	0.01	06-096 CMR 115, BACT
SO ₂	--	0.59	--	06-096 CMR 115, BACT
NO _x	15	9.46	--	06-096 CMR 115, BACT
CO	--	9.60	--	06-096 CMR 115, BACT
VOC	--	1.20	--	06-096 CMR 115, BACT

- B. Except during periods of start-up and shut-down, Turbine #1 shall not exceed the following emissions at ambient temperatures less than or equal to 0°F:

Pollutant	ppmvd @ 15% O ₂	lb/hr	lb/MMBtu	Citation
PM	--	1.19	0.01	06-096 CMR 115, BACT
PM ₁₀	--	1.19	0.01	06-096 CMR 115, BACT
SO ₂	--	0.61	--	06-096 CMR 115, BACT
NO _x	150	78.23	--	40 CFR 60, Subpart KKKK and Chapter 115, BACT
CO	--	59.53	--	06-096 CMR 115, BACT
VOC	--	3.73	--	06-096 CMR 115, BACT

The following shall replace Condition (21) of air emission license A-955-71-A-N:

- (21) M&N shall maintain a log of all turbine case venting and ESD events that includes the following information:
- A. date of the event
 - B. estimated or actual event start time
 - C. estimated or actual event duration
 - D. event source
 - E. event type (shutdown, maintenance, testing, or malfunction)
 - F. description of event
 - G. estimate of the volume of natural gas vented
 - H. estimate of the VOC density of the released gas
 - I. calculation of the tons of VOC emitted based on the VOC content of the gas released

[06-096 CMR 115, BPT]

The following shall replace Condition (23)(A) of Air Emission Licenses A-955-71-A-N and A-955-71-C-M:

(23) **Performance Tests**

- A. M&N shall conduct an initial performance test within 60 days of achieving the compressor unit's maximum production rate or December 31, 2009, whichever occurs first. All testing shall comply with all of the requirements of the DEP Compliance Test Protocol and with 40 CFR Part 60, as appropriate, or other methods approved by the Bureau of Air Quality. A representative of the DEP or EPA shall be given the opportunity to observe the compliance testing.

[40 CFR 60 Subpart KKKK and 06-096 CMR 115, BPT]

The following shall replace Condition (26) of air emission license A-955-71-A-N:

(26) **Generators #1, 2, & 3**

- A. M&N shall limit Generators #1, 2, & 3 to 9,636 hr/yr of operation combined (based on a 12 month rolling total). [06-096 CMR 115, BACT]
- B. Each generator shall be equipped with an elapsed time meter. The value from each meter shall be entered into a spreadsheet on a monthly basis. The spreadsheet shall track operating hours on a monthly and a 12 month rolling total basis. [06-096 CMR 115, BACT]
- C. Generators #1, 2, & 3 shall each fire only natural gas. [06-096 CMR 115, BACT]
- D. Emissions shall not exceed the following:

Emission Unit	Pollutant	lb/MMBtu	Origin and Authority
Generator #1	PM	0.12	06-096 CMR 103
Generator #2	PM	0.12	06-096 CMR 103
Generator #3	PM	0.12	06-096 CMR 103

- E. Emissions shall not exceed the following [MEDEP Chapter 115, BPT]:

Emission Unit	PM (lb/hr)	PM ₁₀ (lb/hr)	NO _x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Generator #1	0.05	0.05	2.58	2.26	0.97
Generator #2	0.05	0.05	2.58	2.26	0.97
Generator #3	0.05	0.05	2.58	2.26	0.97

- F. Visible emissions from Generator #1, 2, & 3 shall each not exceed 10% opacity on a six (6) minute block average basis, except for no more than one (1) six (6) minute block average in a 3-hour period. [06-096 CMR 115, BACT]

The following shall replace Condition (27) of air emission license A-955-71-A-N:

(27) **Boiler #1**

A. Boiler #1 shall fire only natural gas. [06-096 CMR 115, BACT]

B. Emissions shall not exceed the following:

Emission Unit	Pollutant	lb/MMBtu	Origin and Authority
Boiler #1	PM	0.08	06-096 CMR 115, BACT

C. Emissions shall not exceed the following [06-096 CMR 115, BACT]:

Emission Unit	PM (lb/hr)	PM ₁₀ (lb/hr)	NO _x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Boiler #1	0.03	0.03	0.29	0.15	0.02

D. Visible emissions from Boiler #1 shall not exceed 10% opacity on a six (6) minute block average basis except for one (1) six (6) minute average in a three (3) hour period. [06-096 CMR 101]

The following shall replace Condition (30) of air emission license A-955-71-A-N:

(30) **Annual Emissions**

A. Total emissions from licensed equipment shall not exceed the following on a 12 month rolling total basis [06-096 CMR 115, BACT]:

	Ton/year
PM	5.1
PM ₁₀	5.1
SO ₂	2.5
NO _x	53.8
CO	67.2
VOC	33.5

B. M&N shall keep monthly records sufficient to document the facilities emissions on a 12 month rolling total basis and shall make those records available to the Department upon request. [06-096 CMR 115, BACT]

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Condition (32) of air emission license A-955-71-A-N is deleted.

Condition (33) of air emission license A-955-71-A-N is deleted.

The following is a New Condition:

- (34) M&N may install like-kind, manufacturer-supplied replacement components for the turbines that takes place either as part of scheduled maintenance of a turbine or in the event of malfunction or outage and subsequent repair of an engine. M&N shall notify the Department in writing in advance of any replacement of turbine components and shall still be subject to and responsible for any applicable NSPS provisions with respect to replacement of the turbine or any components. [06-096 CMR 115, BACT]

DONE AND DATED IN AUGUSTA, MAINE THIS 5th DAY OF November, 2009.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: 
DAVID P. LITTELL, COMMISSIONER

The term of this amendment shall be concurrent with the term of Air Emission License A-955-71-A-N.

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: 12/22/08

Date of application acceptance: 12/23/08

Date filed with the Board of Environmental Protection: _____

This Order prepared by Lynn Ross, Bureau of Air Quality.

